

appeared to show the existence of double molecules; potassium chloride was normal, and sodium, silver, barium, and strontium nitrates were nearly normal, showing a slight dissociation. Sodium chloride behaved as though dissociated into two, barium and strontium chlorides into three parts, whilst the figures for potassium and sodium sulphates were quite abnormal, being split up into more than three parts.

IN response to a widely expressed request, Dr. H. O. Forbes, director of museums and reader in ethnography in the University of Liverpool, has agreed to publish, in book form, the course of lectures recently delivered by him in the Museums Theatre, on "The Reindeer Hunters: the Golden Age of the Cave-dwellers." The volume will be issued in the autumn.

WE have received a copy of the list of publications already issued by the Carnegie Institution of Washington. The list includes particulars of 118 monographs and other works, many of which have been reviewed in NATURE from time to time, and it provides further evidence of the excellent work which the institution is accomplishing in disseminating a knowledge of recent progress in science. The editions of each book are restricted, and as soon as a volume is issued copies of it are sent gratuitously to a limited number of the greater libraries of the world, while the remainder of the edition is placed on sale at a price sufficient only to cover the cost of publication and of carriage to purchasers.

A NEW and revised edition of Prof. W. Bölsche's book, "Haeckel: his Life and Work," has been published by Messrs. Watts and Co. for the Rationalist Press Association, Ltd. The book is published at the price of 6d., and is provided with an introduction and supplementary chapter by the translator, Mr. Joseph McCabe.

MESSRS. CASSELL AND CO., LTD., have commenced the issue, in fortnightly parts, of Prof. Percy Groom's beautifully illustrated "Trees and their Life-histories." The price of each part is 1s. net, and there will be thirteen of them to complete the work. The same firm is issuing Prof. F. E. Hulme's "Familiar Wild Flowers" in fortnightly parts at 6d. net each, and there will be forty-five parts.

A FOURTEENTH edition of Mr. W. T. Lynn's "Remarkable Comets" has been published by Messrs. Samuel Bagster and Sons, Ltd. In this issue, particularly, the author has endeavoured to bring the information carefully up to date. The price of the little book is 6d. net.

#### OUR ASTRONOMICAL COLUMN.

POSITIONS OF DANIEL'S (1907d) AND MOREHOUSE'S (1908c) COMETS.—Comet 1907d having been observed during the opposition of 1908, Herr H. H. Kritzinger has calculated an ephemeris for the coming opposition, and publishes it in No. 4317 of the *Astronomische Nachrichten*. The ephemeris position for April 16 is 15h. 20m.,  $-7^{\circ} 50'$ , and the estimated magnitude is 14.3, but the comet may be as much as 3.8 magnitudes fainter than this. There is just a possibility, however, that it may be re-observed by long-exposure photographs.

An ephemeris for comet 1908c, prepared by Dr. Ebelt, appears in No. 4309 of the *Astronomische Nachrichten*, and gives the positions and estimated magnitudes of the comet up to the end of June. From this we see that the comet will not rise in these latitudes until about the end of May,

and will then be only about one-third as bright as it was when discovered.

SUN-SPOTS AND SOLAR TEMPERATURE.—In the March number of the *Observatory* Mr. Evershed continues the discussion as to the interpretation of the phenomena of the sun-spot spectrum with regard to temperature. In a previous letter Prof. Whittaker suggested that the tube-furnace phenomena observed by Dr. King might be produced by the direct action of the radiation absorbed from the heated walls of the solid tube rather than in consequence of the collisions between the molecules of the gases themselves. This suggestion Mr. Evershed believes to be unnecessary for the explanation of the radiations observed, and he adduces evidence showing that the molecules of the gases, when excited thermally, are capable, by their mutual collisions at high velocities, of producing the radiations.

In regard to Prof. Whittaker's second suggestion, that the increased intensity of spot lines may be due to enormous pressures obtaining in the lower parts of the chromosphere, Mr. Evershed quotes experimental results showing that such pressures are unnecessary for the production of the intensifications, and then shows that the evidence for the existence of the pressure-differences required by this hypothesis is insufficient. He mentions, parenthetically, that he has observed what appears to be a minute pressure effect on certain lines measured at the sun's limb, and suggests that further observations of this phenomenon may lead to conclusions regarding the various levels at which absorption takes place.

THE APPARENT DISPERSION OF LIGHT IN SPACE.—In an article appearing in the March number of the *Astrophysical Journal* (vol. xxix., No. 2, p. 101) Prof. Lebedew criticises the conclusions arrived at by Belopolsky, Nordmann, and Tikhoff concerning the dispersion of light in interstellar space.

In the first place, he shows that if the delay found by Tikhoff and Nordmann were due to ponderable matter, the absorption produced by such matter would be so great as to render the sun and stars invisible to us. There remains the possibility that the aether itself disperses, without absorbing, light, but this entails an attack on the electromagnetic theories of light, which Prof. Lebedew believes to have been too firmly established, by theory and experiment, to allow of any attack being made simply to explain a series of astronomical observations.

Prof. Lebedew then shows that Tikhoff's assumptions are unsafe, and that his results do not agree sufficiently closely with those of Nordmann to produce conviction, and, finally, he shows that in the case of such systems as those of  $\beta$  Aurigæ and R.T. Persei physical processes sufficient to produce the phenomena observed may be readily conceived.

COLOURED STARS IN THE GLOBULAR CLUSTER M 13.—In the October number of the *Astrophysical Journal* for 1900 Prof. Barnard directed attention to some "abnormal" stars observed by him in the globular cluster M 13 Herculis, such stars being relatively much fainter visually than photographically.

Since the publication of this result he has found other stars of this class in the same cluster, and also in M 5 Librae. On comparing a photograph of the cluster taken with the Potsdam refractor with one taken with the Yerkes 40-inch refractor fitted with a yellow screen, he was surprised to find that there were many more of these "blue" stars than he had hitherto found; further, a large number of the stars of this cluster must be yellow, for they are relatively much brighter on the Yerkes than on the Potsdam photograph.

Thus, while it is impossible visually to observe any difference in the colours of the stars of M 13, the above comparison shows that great differences of colour, and hence of spectral type, do exist, and Prof. Barnard now gives tables showing which are the blue and which are the yellow stars; he also mentions one or two striking examples of colour-difference, and briefly discusses the variable stars hitherto discovered in this cluster (*Astrophysical Journal*, vol. xxix., No. 1, p. 72).

THE UNITED STATES NAVAL OBSERVATORY.—The report of the U.S.A. Naval Observatory, Washington, for the fiscal year ending June 30, 1908, contains several important announcements, and gives the record of the work done during the year.

Rear-Admiral Walker having retired from the superintendence on November 13, 1907, Captain W. J. Barnette was appointed to the position, and submits this report.

Having asked a board of astronomers to report on the state of the observatory and the most proper work for it to perform, he received a report in which it was laid down that astronomy of position, rather than astrophysics, should be the principal work of the observatory. In order to secure the continuity and coordination of the work, an astronomical council, consisting of the officers of the observatory, was appointed, and will in future act as an advisory council in connection with all the work, astronomical and administrative, of the observatory.

The climatic and terrestrial conditions at Tutuila, Samoa, having been found too unfavourable, the branch observatory established there in 1904 has been discontinued.

#### SCIENTIFIC AGRICULTURE.<sup>1</sup>

THE bulk of this work is taken up by the reports on economic zoology and mycology; the remainder comprises reports from the veterinary, chemical, and botanical departments, and the farm report.

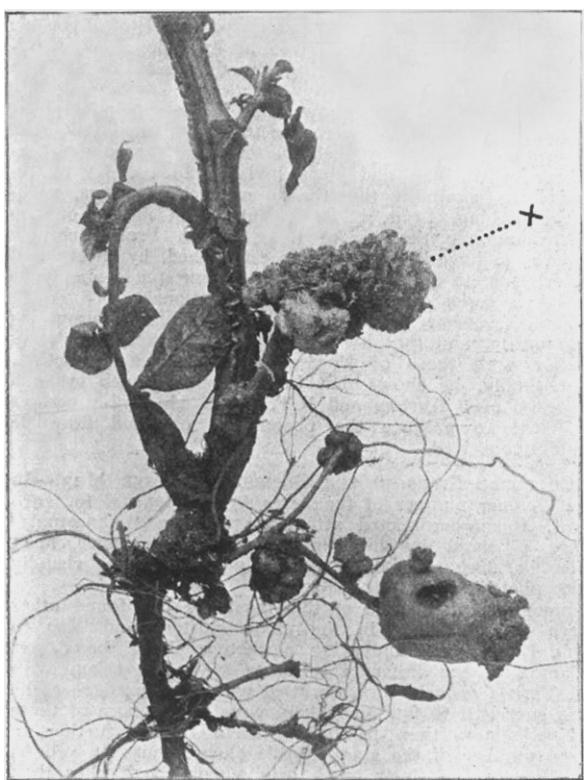


FIG. 1.—Photograph of a growing potato plant attacked by the "Black Scab." At X is a diseased shoot above ground; several young diseased potatoes can be seen below.

The determination of the digestibility of feeding stuffs, giving, as it does, an insight into Continental methods, is of exceeding interest to all scientific agriculturists. Prof.

<sup>1</sup> The Journal of the South-Eastern Agricultural College, Wye, Kent. No. 17. Pp. 478. (London and Ashford: Headley Bros., 1908.) Price 6s.; Residents in Kent and Surrey, 3s.

F. V. Theobald's work is well known, and in his contribution to the journal the notes on the damage to hops by *Entomobrya nivalis*, Linn., and on the occurrence of *Rhagoletis cerasi* in imported cherries, are worthy of

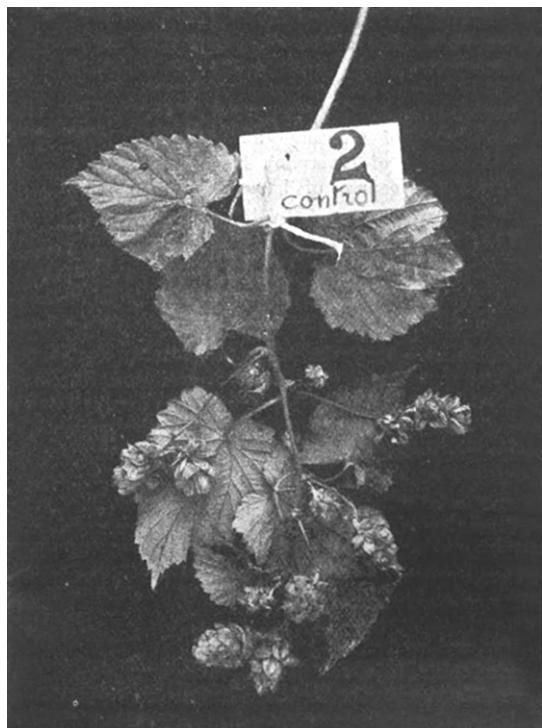


FIG. 2.—A branch of seedless Golding Hops.

special mention. Most of the illustrations in this section are excellent.

The report on economic mycology contains articles on American gooseberry mildew and on black scab, among others, illustrated by a series of twenty-six splendid plates, one of which is reproduced here. This shows very plainly the peculiar warty outgrowths to be found, not only on the tubers, but on the shoots and leaves of potatoes attacked by *Chrysophlyctis endobiotica*. Hops, as is fitting in a hop-growing district, receive attention, and the article on the value of the male hop, illustrated by most lucid plates, is by no means the least important item in the journal. The plates illustrating "seeded" and "seedless" Golding hops, taken from the same bine, show one of the effects of fertilisation, viz. that "growing out" takes place along with seed production; in fact, the investigations carried out at Wye prove beyond question that only "seeded" hops will grow out properly. The "growing out" takes place immediately after fertilisation, thus obviating a long "burr" period, a period in which there is the greatest danger of attack by "mould."

The amount of resins, too, is increased by more than one-half as a result of fertilisation; in fact, the quantity and quality of hops is improved by the presence of the male hop. This was shown in a practical manner by the fact that samples of "seeded" and "seedless" hops, grown in the college hop-garden, were submitted to the hop-factors for valuation, and it was found that the "male plant had increased the value of the crop (at the price of hops then current) by the sum of 24*l.* 10*s.* per acre." Such investigations are not only of absorbing interest, but of the greatest possible utility.

One always looks for good work in the veterinary department, and the present report is no exception, but mention can only be made of the discovery of *Strongylus*